

A Taxonomic Review of the genus *Liriomyza* (Diptera: Agromyzidae) from Korea

Sang Jae Suh and Yong Jung Kwon*

(Department of Horticulture, Sangju National University, Sangju 742-711, Korea;

*Department of Agricultural Biology, College of Agriculture, Kyungpook National University,
Taegu 702-701, Korea)

ABSTRACT

In this paper, a total of eight species of the genus *Liriomyza* are treated. Among them, three species are reported for the first time from Korea. A key to Korean species, host plants and domestic localities are given. Some illustrations of male genitalic features are included.

Key words: systematics, Diptera, Agromyzidae, Korea

INTRODUCTION

Most agromyziid flies are leaf-miners of living plants during larval stages, whereas the remainders are stem-borers and seed-feeders. Thus, many species are injurious to cultivated plants.

The genus *Liriomyza* Mik is one of the largest group of the subfamily Pytomyzinae, and comprises over 250 species throughout the world. The generic characteristics are as follows: orbital setulae reclinate; costa extending to vein M_{1+2} ; the second cross-vein is present; epandrium is armed with a spine on each inner caudodorsal angle.

The first record of this genus from Korea was given by Kor. Soc. Plant Prot. (1986) which listed *Liriomyza congesta* as the pest of Leguminosae. Shortly later, Choi *et al.* (1990) recorded *Liriomyza chinensis* being injurious to the *Allium fistulosum*. After then, Choi *et al.* (1992) gave

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an ecological observation of *Liriomyza* sp. injurious to *Callistephus chinensis*. Subsequently, Ahn *et al.* (1993) reported *Liriomyza bryoniae* attacking to *Raphanus sativus hortensis*. They (1994) also reported the occurrence of *Liriomyza trifolii* on various vegetables in southern Korea. Recently, Choi and Woo (1995) reported *Liriomyza bryoniae* and *L. yasumatsui* from central Korea.

In this paper, we add three species hitherto unrecorded to Korean fauna. As the result, a total of eight species are listed here to be occurred in Korea.

The following abbreviations are used for localities: CN, Chungcheongnam-do; GB, Kyeongsangbuk-do; GG, Kyeonggi-do; GN, Kyeongsangnam-do; JB, Cheollabuk-do; JJ, Cheju-do; JN, Cheollanam-do.

SYSTEMATICS

Genus *Liriomyza* Mik, 1894 애잎굴파리 속 (신칭)

Liriomyza Mik, 1894, p. 284.

Type-species : *Agromyza urophorina* Mik, 1894 (Sweden).

Key to the Korean *Liriomyza* species

1. Scutellum entirely black *L. chinensis*
- Scutellum at least partially yellow 2
2. Outer vertical bristle situated on yellow area 3
- Outer vertical bristle situated on black area 5
3. Mesonotum with two rows of acrostichal bristles *L. congesta*
- Mesonotum with four rows of acrostichal bristles 6
4. Discal cell moderate, last section of vein M_{3+4} distinctly more than twice as long as penultimate *L. yasumatsui*
- Discal cell large, last section of vein M_{3+4} about twice as long as penultimate 5
5. Lateral black marking of scutellum narrow; basal scutellar bristle situated on black area *L. bryoniae*
- Lateral black marking of scutellum broad; basal scutellar bristle situated on edge of black area *L. trifolii*
6. Mesopleuron with large triangular patch along lower margin; pteropleuron strongly darkened by irregularly black marking *L. asterivora*
- Mesopleuron with small black patch at middle along lower margin; pteropleuron with small black spot or without black marking 6
7. Third antennal segment darkened distally; distiphallus tightly fused with mesophallus *L. artemisiae*
- Third antennal segment not darkened distally; distiphallus slightly separated from mesophallus *L. pusilla*

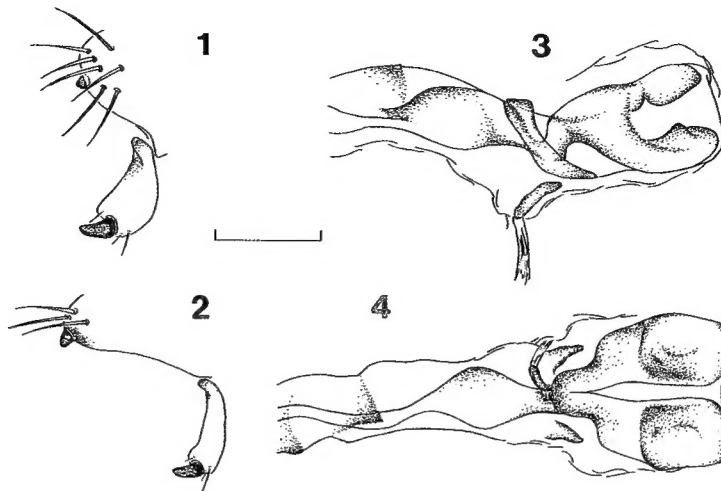


Fig. 1. Male genitalia of *Liriomyza artemisiae*: 1, epandrium and surstylus, dorsal view; 2, ditto, caudodorsal view; 3, aedeagus, lateral view; 4, ditto, ventral view (scale: 0.05 mm).

1. *Liriomyza artemisiae* Spencer, 1981 오이풀굴파리 (신칭) (Fig. 1)

Liriomyza artemisiae Spencer, 1981, p. 213.

Material examined. 3♂♂, 3♀♀, from larvae, 23 Sep. 1985, Taegu, on *Sanguisorba officinalis*, emerged 11 Oct. 1985, S. J. Suh.

Locality. GB: Taegu.

Description. Head about 1.7 times as high as long in profile; frons yellow, slightly wider than eye; orbit somewhat paler than frons, with two reclinate upper orbital bristles and two incurved lower orbital bristles; inner vertical bristle situated on edge of yellow area but outer vertical bristle on black area; jowl yellow, somewhat deepened posteriorly, about 1/4 eye height; antenna yellow, third segment darkened distally. Mesonotum shiny black, with four acrostichal bristle rows; humerus yellow with black marking on anterior part; notopleuron with narrow black striation on lower margin; mesopleuron with black patch at middle along lower margin; stenopleuron black with yellow upper margin and stenopleural bristle located on yellow area. Leg with coxae and femora yellow, somewhat variably darkened by irregularly brown or black marking or striation; tibiae and tarsi dark brown. Wing rather dark tinged; calypter and fringe black; halter yellow.

Length. Body: 1.4–1.7 mm; wing: 1.5–1.7 mm.

Host. *Artemisia douglasiana* (cf. Spencer, 1976); *Artemisia princeps* (cf. Sasakawa, 1994); *Sanguisorba officinalis*.

Distribution. Korea (South), Japan, USA.

2. *Liriomyza asterivora* Sasakawa, 1956 썩바귀굴파리 (신칭) (Fig. 2)

Liriomyza asterivora Sasakawa, 1956, p. 127.

Material examined. 4♂♂, 6♀♀, from larvae 29 Oct. 1985, on *Ixeris dentata*, Taegu, emerged 16 Nov. 1985, S. J. Suh.

Locality. GB: Taegu.

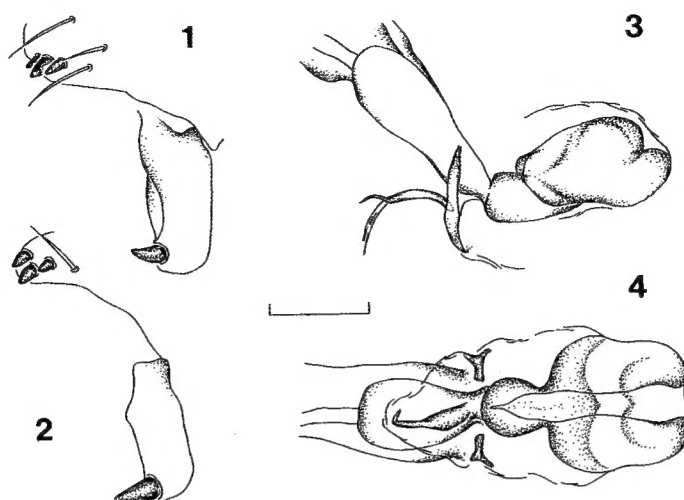


Fig. 2. Male genitalia of *Liriomyza asterivora*: 1, epandrium and surstylus, dorsal view; 2, ditto, caudodorsal view; 3, aedeagus, lateral view; 4, ditto, ventral view (scale: 0.05 mm).

Description. Head about 1.7-1.8 times as high as long in profile; frons yellow; orbit somewhat paler than frons, with two reclinate upper orbital bristles, two or three incurved lower orbital bristles and some setulae; inner vertical bristle arising from edge of yellow area, outer vertical bristle from black area; jowl yellow, about 1/3 eye height; antenna yellow or brownish yellow. Mesonotum shiny black, with four acrostichal bristle rows; humerus yellow with black marking on anterior part; notopleuron yellow with narrow black striation on lower margin; mesopleuron with dark triangular marking along lower margin; pteropleuron strongly darkened by irregularly brown or black marking; stenopleuron black with yellow upper margin and stenopleural bristle situated on yellow area. Leg with coxae and femora yellow; tibiae and tarsi dark brown.

Length. Body: 1.7-1.9 mm; wing: 1.7-1.9 mm.

Host. *Aster indicus*, *Synedrella undiflora* (cf. Sasakawa, 1960); *Ixeris dentata*.

Distribution. Korea (South), Japan, Malaysia.

3. *Liriomyza bryoniae* (Kaltenbach, 1858) 오이굴파리

Agromyza bryoniae Kaltenbach, 1858, p. 158.

Liriomyza solani Hering, 1927, p. 181.

Liriomyza mercurialis Hering, 1932, p. 165.

Liriomyza citrulli Rohdendorfi, 1950, p. 82.

Liriomyza bryoniae: Ahn *et al.*, 1993, p. 822¹.

Liriomyza bryoniae: Ahn *et al.*, 1994, p. 882.

Locality. GG: Suwon¹.

Host. Solanaceae, Scrophulariaceae, Labiatae, Umbelliferae, Compositae (cf. Sasakawa, 1960); *Solanum tuberosum* (cf. Spencer, 1976), *Raphanus sativus hortensis* (cf. Ahn *et al.*, 1993), *Apium graveolens* (cf. Ahn *et al.*, 1994).

Distribution. Korea (Central), Japan, Europe, N. Africa.

4. *Liriomyza chinensis* (Kato, 1949) 파굴파리*Dizygomyza cepae chinensis* Kato, 1949, p. 12.*Liriomyza chinensis*: Choi *et al.*, 1990, p. 91¹⁻².*Liriomyza chinensis*: Ahn *et al.*, 1991, p. 66²⁻¹⁵.

Locality. GB: Taegu, JB: Cheonbuk¹, Kimje³, Puan (=Buan⁴), Kochang (=Gochang⁵), Namweon (=Namwon⁶), Imsil⁷, Wanju⁸, JN: Cheonnam², Naju⁹, Yöngam (=Yeongam¹⁰), Posöng (=Boseong¹¹), Süngju (=Seungju¹²), Kokseong (=Gogseong¹³).

Host. *Allium fistulosum*, *A. ascalonicum* (cf. Choi *et al.*, 1990; Ahn *et al.*, 1991).

Distribution. Korea (Central, South), Japan, China, Malaysia, Singapore.

5. *Liriomyza congesta* (Becker, 1903) 콩잎굴파리*Agromyza congesta* Becker, 1903, p. 2.*Liriomyza minima* Hendel, 1931, p. 233.*Liriomyza parva* Hendel, 1931, p. 240.*Liriomyza centaureana* Hering, 1936, p. 175.*Liriomyza nigripleura* Rydén, 1956, p. 195.*Liriomyza congesta*: Spencer, 1973, p. 94.*Liriomyza congesta*: Kor. Soc. Plant Prot., 1986, p. 247.*Liriomyza congesta*: Ent. Soc. Kor. and Kor. Soc. Appl. Ent., 1994, p. 296 (Korea).

Locality. GB: Suwon.

Host. Leguminosae (cf. Spencer, 1976; Kor. Soc. Plant Prot., 1986).

Distribution. Korea (South), Japan, Europe, N. Africa.

Remarks. The Korean species name, 'Kongipgulpari', was originally referred to *Japanagromyza variihalterata* Malloch (= *J. tristella* Thomson) by Rural Dev. Adm. (1978). However, the name has been transferred to *Liriomyza congesta* Becker due to the economic importance of the pest status since the amendment by Kor. Plant Prot. Soc. (1986).

6. *Liriomyza pusilla* (Meigen, 1830) 과꽃굴파리 (신칭) (Fig. 3)*Agromyza pusilla* Meigen, 1830, p. 185.*Agromyza fasciola* Meigen, 1838, p. 204.*Liriomyza pusilla*: Spencer, 1976, p. 266.*Liriomyza* sp.: Choi *et al.*, 1990, p. 31.

Material examined. 11 ♂♂, 4 ♀♀, from larvae, 19 Jul. 1998 on *Callistephus chinensis*, Taegu, emerged 29 Jul. 1998, S. J. Suh.

Locality. GB: Taegu.

Description. Head about 1.6 times as high as long in profile; frons yellow or brownish yellow, slightly wider than eye; orbit with two reclinate upper orbital bristles, two incurved lower orbital bristles and some setulae; inner vertical bristle situated on edge of yellow area but outer vertical bristle on black area; jowl yellow, somewhat deepened posteriorly, about 1/3-1/4 eye height; antenna yellow or brownish yellow. Mesonotum shiny black, with four acrostichal bristle rows; humerus with black marking on anterior part; notopleuron with narrow black stripe on lower margin; mesopleuron with black patch at middle along lower margin; stenopleuron black with

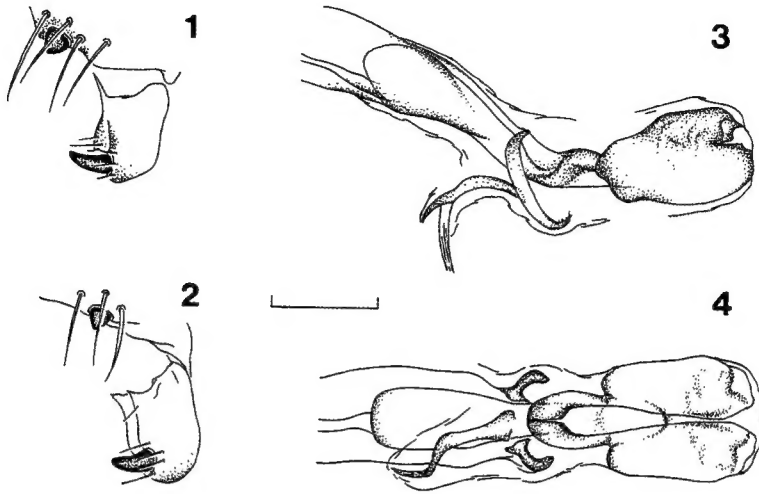


Fig. 3. Male genitalia of *Liriomyza pusilla*: 1, epandrium and surstylus, dorsal view; 2, ditto, caudodorsal view; 3, aedeagus, lateral view; 4, ditto, ventral view (scale: 0.05 mm).

yellow upper margin, stenopleural bristle located on yellow area. Leg with coxae and femora yellow; tibiae and tarsi dark brown. Wing rather dark tinged; calypter and fringe dark brown; halter yellow.

Length. Body: 1.7–1.9 mm; wing: 1.7–1.9 mm.

Host. *Bellis*, *Aster*, *Solidago* (cf. Spencer, 1976); *Kalimeris yomena*, *Artemisia princeps*, *Aster* sp. (cf. Sasakawa, 1994); *Callistephus chinensis* (Choi *et al.*, 1992).

Distribution. Korea (South), Japan, Europe, Taiwan.

7. *Liriomyza trifolii* (Burgess, 1880) 아메리카잎굴파리

Oscinis trifolii Burgess, 1880, p. 201.

Liriomyza alliavora Frick, 1955, p. 88.

Liriomyza trifolii: Ahn *et al.* 1994, p. 881¹⁻³.

Liriomyza trifolii: Han *et al.* 1996, p. 309^{1,3-26}.

Locality. CN: Seosan⁴, Taean⁵; GB: Taegu; GG: Icheon⁶, Koyang⁷, Yongin⁸; GN: Chinju¹, Chinyang⁹, Hamyang¹⁰, Kangseogu¹¹, Kimhae¹², Masan¹³, Sancheong¹⁴; JB: Iksan¹⁵, Wanju¹⁶; JJ: Cheju¹⁷, Namjeju¹⁸, Pukjeju¹⁹, Seoguipo²⁰; JN: Hwasun², Kogseong²¹, Kurye²², Kwangsan-gu³, Poseong²³, Suncheon²⁴, Seongju²⁵, Tonggwangyang²⁶.

Host. Chenopodiaceae, Compositae, Cucurbitaceae, Leguminosae, Liliaceae, Malvaceae, Solanaceae, Umbelliferae (cf. Spencer, 1973; Ahn *et al.*, 1994; Han *et al.*, 1996).

Distribution. Korea (Central, South), Japan, Taiwan, Philippines, Europe, Canada, U.S.A., Bahamas, Barbados, Guyana, Venezuela, .

8. *Liriomyza yasumatsui* Sasakawa, 1972 쓱굴파리 (신칭)

Liriomyza yasumatsui Sasakawa, 1972, p. 69.

Liriomyza yasumatsui: Choi and Woo, 1995, p. 414.

Locality. GB: Sobaeksan.

Host. *Artemisia princeps* (cf. Sasakawa, 1994).

Distribution. Korea (Central, South), Japan, Taiwan.

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한국산 애잎굴파리 속의 분류 (파리 목: 굴파리 과)

서 상 재 · 권 용 정*

(상주대학교 원예학과, *경북대학교 농과대학 농생물학과)

요 약

한국산 애잎굴파리 속을 분류 동정한 결과, 모두 8종으로 정리되었으며, 그 중에서 3종은 한국 미기록종으로 처음 보고된다. 국내 분포종에 대한 검색표를 작성하였으며, 기주식물 및 채집지를 정리하였다.